

SUBTERRANEA BRITANNICA

Bulletin No. 12

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Bulletin compiled by Sylvia P. Beamon.

EDITORIAL

We would like to offer our congratulations to the Société Belge D'Étude des Souterrains on the first edition of their publication Subterranea Belgica, and look forward to receiving further copies.

Even though there is pressure of space for this edition of the Bulletin, it is essential that there is a mention of the most successful Study Weekend held in Bristol at the beginning of July, and our thanks must go to Phil Marshall for his excellent arrangements and organisation for this memorable occasion.

Karl Schwarzfischer and other members of Arbeitskreis für Erdstallforschung must also be congratulated for the splendid July International Symposium held at Roding in Bavaria - a report will appear in the next Bulletin.

SYLVIA P. BEAMON

WINTER DAY CONFERENCE

The conference held on Saturday, 26th January 1980 at Lucy Cavendish College opened with Brief Communications. Mrs. Margaret Walker gave a resumé of the survey carried out of a cellar at Baldock, Herts. (see pages 14 - 16).

Dr. Harold M. Taylor, M.B.E. who was Vice Chairman of Keele University before his retirement and is a Fellow of Clare College, Cambridge lectured on the Anglo-Saxon Crypt at Repton, one of the four known Anglo-Saxon crypts. He illustrated this most interesting account with slides showing the current and past excavation work. He considers the crypt was built either by King Wiglaf (827-840 AD) himself in anticipation of his death or built for him.

After lunch Mrs. Patricia M. Christie, F.S.A. gave a follow-on lecture with slides, from her first lecture to the Society in 1974, on the Carn Euny Fogou which was much appreciated. (see pages 11 - 13)

Roger Morgan, B.Sc., member of the London Subterranean Survey Association, described many subterranean features of Underground London from water conduits, the Blackwall tunnel construction to Churchill's Bunker in the last war. An article on this subject will appear in a future Bulletin.

SPRING TRIP TO EASTRY, KENT

On May 10th, this year, several members visited the large and elaborate chalk excavations at Eastry, the origins of which have always been somewhat obscure. It has some of the features of a chalk mine but also many of the uneconomic aspects associated with follies. It has slopes, staircases, beehive rooms and painted areas for example, simulated church stained glass windows. A booklet produced for the Eastry 1000 exhibition states the following information:

"Between 1810 and 1820 Abraham Ford (1781 - 1868), a bricklayer and lime burner and his family began extracting chalk from the caves at the house known as Becketts. The lime kiln there was first mentioned in the rate books in 1822. Henry Foord, one of Abraham's sons, who was an amateur map-maker, drew a plan of the workings in 1833 and lime burning continued on the site until the first World War." (Ref: H. Pearman - Newsl. Chelsea Speleological Soc. 22(5), page 56. Feb. 1980)

We would like to thank Miss G. B. Moncur and Miss P. J. Morgan for allowing us the opportunity of viewing these chalk workings.

Location and Geology

The building-stone mines, or underground quarries, described here lie on either side of the Dutch / Belgian border, within about 15 km of Maastricht in southernmost Holland. They are found in the Dutch province of Zuid Limburg and, in Belgium, in the provinces of Limburg and Luik (Liege). The beds worked, and so the mines, appear not to extend into the adjacent parts of Germany around Aken (Aachen). These are all drift-mines made within selected layers in the almost flat-lying Upper Cretaceous limestones or hard chalks which form a plateau in this region which is capped by Oligocene and later sands, gravels and loess, and dissected by the river Maas (Meuse) and its tributaries such as the Jeker (Jaar or Geer), the Geul, etc.

Nature of the Stone and Mineral Products

The beds mined consist of more or less hard chalks (considerably harder than our soft white Upper Chalk in England) and creamy-yellow sandy-textured limestones. Layers of irregular flints occur at various horizons, although much of this flint is rather more chert-like than flinty in English terms. Pannekoek (1956) provides an accessible summary of the geology.

Flint

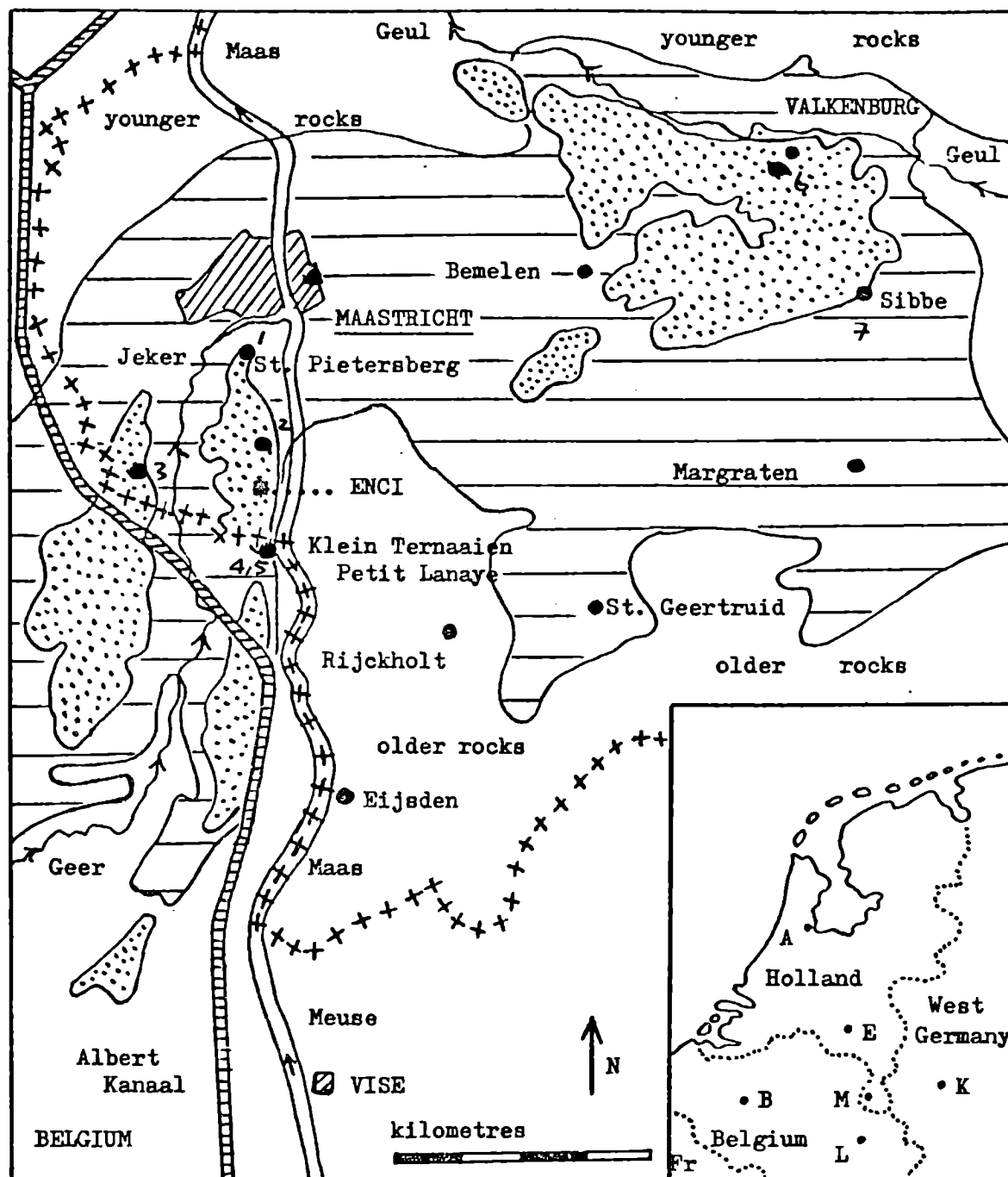
The earliest mining in the district was in fact for flint, in the neighbourhood of the two Dutch villages Rijckholt and Sint Geertruid, about 7 km south-east of Maastricht. These flint-mines appear to be comparable to those at Grimes Graves in Norfolk, and have been dated to around 3,000 BC. They have been described by Felder & Rademakers (1973), and in a brochure produced by Maastricht Bonnefantennmuseum (1975) for a display comparing the English and Dutch sites. Flint was also encountered in the other, later, mines in the district but appears to have found little use beyond road metal; flint buildings are conspicuous by their absence.

Agricultural Lime

Pannekoek (op. cit.) reports that all three calcareous divisions of the Upper Cretaceous beds in the area have been used as a source of agricultural lime: the are the Gulpense Kalk, a 'lime fertilizer', the Kunrader Kalk, 'used in lime kilns', and the Maastrichtse Kalk itself. In places, more especially in Belgium, mines appear to have been made solely for calcareous materials for lime. A good example, albeit in Landenian strata, is provided by the two sets of 'show caves' at farms at the small Belgian village of Folx-les-Caves (midway between St. Truiden and Namur) described (along with 20 other mines and souterrains in Belgium) by Martynoff & Lambert (? 1976).



More often, though, agricultural lime was worked either simultaneously with dimension stone in the subterranean quarries, or by secondary working on those quarries' abandonment. Such secondary working is particularly striking in the 'carrieres souterrains de Vechmael' (also described by Martynoff & Lambert), near Tongeren. Here, at least two or three quarries, more or less accessible and more or less blocked, collapsed, and partially flooded, display the characteristic rectangular-section galleries of workings for dimension-stone, and drastic pillar-robbing by crude hacking away for lump limestone; secondary working for lump limestone by deepening the galleries was also noted here.

The extraordinarily extensive and spacious stone quarries Ternaaien beneden and Ternaaien boven (the lower and upper quarries) at Klein Ternaaien (Petit Lanaye),



THE MAASTRICHT - VALKENBURG - VISE DISTRICT

Southernmost Holland / North-east Belgium

The outcrop of the Maastrichtse Kalk is shewn  Most of the building-stone mines are within the hills capped with Oligocene deposits shewn 

The older rocks, to the south, include the Gulpense Kalk, the Vaalser Groenzand and the Carboniferous strata around Vise.

INSET : LOCATION OF MAASTRICHT - VALKENBURG - VISE

A = Amsterdam E = Eindhoven M = MAASTRICHT K = Köln
 B = Bruxelles L = Liege

Building-Stone Mines in Holland & Belgium (Cont'd)

the first village in Belgium on the west-bank road southwards from Maastricht, also shew evidence for extensive extraction of agricultural lime. In the lower quarry, certain of the galleries have every appearance of having been mined for lump lime in the first instance - they are as high as the building-stone galleries (10m or more), and almost if not quite as wide (ca. 4m) but have a quite distinctive arched profile rather than rectangular. In the upper quarry, great quantities of flints have been taken up from the floor (they had dictated the limit of working usable building-stone downwards) and stacked in side galleries, thus facilitating the removal of lump limestone by rough excavation to an additional depth of ca. 2m in the gallery floors. Interestingly, by contrast with south-east England, flint is conspicuously absent from buildings or even rough walling in the district. There was no point in using such irregular and intractable material when the mines supplied abundant stone cheaply enough to allow even farmyard walls to be built of very respectable ashlar. One of the very few flint buildings in the neighbourhood is reputedly in Klein Ternaaien, almost immediately outside the mines though.

In the Sibbegroeve, some 9 km east of Maastricht and the only mine still being worked, in a small way, for building-stone, there are galleries where, instead of the floor being excavated for agricultural limestone, the roof has been heightened instead - apparently partly for convenience (this is the only single-stage mine I have seen in this area, as will be explained below) and partly for lime.

Perhaps the commonest means, and the most convenient, of securing agricultural lime, though, was the removal of waste stone dust and chippings - of which there was an abundant supply resulting from the method of cutting squared blocks by sawing. The quantity of 'deads' or 'gob' is strikingly small by comparison with English stone-mines at, for example, Chaldon in Surrey or Box in Wiltshire (now Avon). As a consequence, these Dutch and Belgian mines are all the more impressive - not only are the galleries often very high and wide, as already mentioned, but generally very clear of obstructions as well.

Building - Stone

The primary purpose of these extraordinarily huge and extensive mines, though, was for neatly sawn blocks of squared stone for building - and vast quantities have clearly been taken from, on the Dutch side of the border alone, at least 150 underground quarries (catalogued and described by van Wijngaarden (1967)).

Some rather brief descriptions of some of these mines have appeared in English. Smith's account (1959) is inaccurate and misleading - he speaks of 'caves', 'few in number, small in size' - and evidently based only on visits to 'show caves' on the Dutch side of the border. Stebbings' brief account (1971) is altogether more reliable, and is accompanied by a specimen plan of Geul-hemergroeve. And an extensive description, with plans, of the Noordelijk stelsel (northern series) and stelsel Zonnenberg, both excavated into the hill St. Pietersberg immediately to the south of Maastricht, is provided by van Schaik (1945). Brief descriptions in French include those of Ubaghs (1879) and Fourmarier & Denoël (1930). Kellenaers (nd) and van Schaik (1948) provide detailed and illustrated Dutch descriptions and plans of the two St. Pietersberg 'show caves' already mentioned.

Methods of Working

The first drifts were probably taken underground from small open quarries. Maastricht is an ancient town, having Roman origins, and it seems probable that some of the earliest quarries would have been worked into the nearby St. Pietersberg, whose steep flanks, in places, and superincumbent overburden of incoherent detrital deposits would alone have dictated subterranean

Building-Stone Mines in Holland & Belgium (Cont'd)

rather than opencast quarrying on any scale. The first phase of development of most of the larger mines now accessible appears to have been pillar and stall working, with eyes as wide as the stalls cut through the pillars, and a floor-to-roof height of about 2 to 3 m. Galleries were thus formed, 3 to 4 m wide, in a more or less rectilinear pattern, interspersed with pillars 3 to 4 m square. Some variant plans are figured by van Wijngaarden (1967).

Blocks of stone 0.6 - 0.75 m square and 1 to 3 m high were sawn from the working faces, allowed to tip forward onto a soft heap of sandy 'stone-dust' and taken out of the mines on horse-drawn carts with large-diameter (about 1.5 m) wheels whose axle-ends have left prominent scorings on main driveway walls and corners. It seems likely that the stones were more often than not taken direct to local building-sites and reduced to more or less standard-sized blocks for walls (about 0.15 m square by 0.4 m long) by the builders; the stone is not very strong, and would survive cartage better as one large piece rather than a cartload of smaller ones free to rattle together.

Double saw-cuts were made, as far as it was possible to saw, for each face, resulting in the production of a thin (0.05 m thick) slab of waste stone which was either discarded as 'deads' or taken out for agricultural lime. The waste slab and the second triangular half of each face was removed using a 'beitel' - a heavy chisel-ended iron bar, the considerable weight of which, as it was 'jumped' in the 0.05 m wide cut, cleared the remainder of the face being cut. This method of cutting blocks appears to have been standard over a long period of time and throughout numerous mines; it is still in use on a small scale in Sibbegroeve today; and is described in detail, with illustrations, by de Grood & Hillegers (nd). It leaves a very distinctive pattern of saw and 'beitel' markings on the mine walls and ceilings. Two or three shapes of stone saw (as in the Bath stone mines at Box, Corsham, and district) were used - narrow-ended ones for commencing a cut, and heavier ones wide ing away from the handle for the main down-cutting. The other main tool used seems to have been a 'debber' or narrow scoop or scraper for clearing loose sandy dust from the double saw cuts. Picks appear not to have been used, except in the earlier workings; nor were wedges, plugs and feathers, or crow-bars, which would have seriously damaged the soft stone. The working techniques were thus quite unlike the picking and wedging employed in the fire-stone mines of Surrey; and afford interesting comparisons, too, with the single saw-cuts, plugs and feathers, wedges, jads, lewis-pins and cranes used in the Bath stone mines.

Numerous charcoal tally-marks on the walls indicate that blocks of stone were counted out in fives. One of the men working in the Sibbegroeve using these traditional techniques for cutting produces one large block per day. A mechanised, though still very small, concern in another part of this immense and mostly abandoned working uses electric saws and a crane, and can thus turn out six to eight blocks a day.

The traditional tools are illustrated by de Grood & Hillegers (nd), and specimens (and a few old photographs) are displayed in the Streek Museum at Valkenburg.

Further contrasts with English stone mines are the almost total absence of either wooden pit-props of any kind (the ceilings were too high), or stone-built pillars (the stone has a notoriously low crushing strength). Nor is much dry-stone walling encountered (there was little in the way of 'deads' to be tidied out of the way.)

As with a number of English building-stones, some attempt was made, at least on occasions, to avoid 'surbedding' - the 'way up' of a block could be told from its toolmarking, or was sometimes marked on it in the quarry. It is reported that the stone, which is very soft underground, hardens with exposure (although the carved holiday-makers' graffiti on the walls of the railway station at Valkenburg demonstrate that this hardening can only be slight!)

Building-Stone Mines in Holland & Belgium (Cont'd)

But although it is known to have been 'stockpiled' below ground at times - 2,000 blocks (perhaps 2,000 man-days' work) were buried under a roof-fall in the Gemeentegrot at Valkenburg in January 1868 and are still there - I saw no substantial evidence for open or roofed seasoning yards above ground such as were found in England.

Multi - Stage Working

The working heights of the first-phase galleries were determined both by convenience and by the occurrence of levels of useless stone containing flint. When the first phase of a mine reached its fullest lateral extent, which was frequently very considerable, a further layer of stone was generally taken from the floor throughout the mine - thus approximately doubling the floor-ceiling height of the workings. If in the course of this process unsound rock or flint had to be cleared away first (thus providing the most significant source of deads within the mines) the overall resultant height of the workings was of course further increased. Three, four, and even five phases of such workings are commonplace, and maximum ceiling heights of 10 to 14m are found. Similar multi-stage mining is of course well-known in the chalk and sand mines of south-east England where it was resorted to to maximise production from large thicknesses of more or less homogeneous strata within which unsupported roof spans of any great width were impossible.

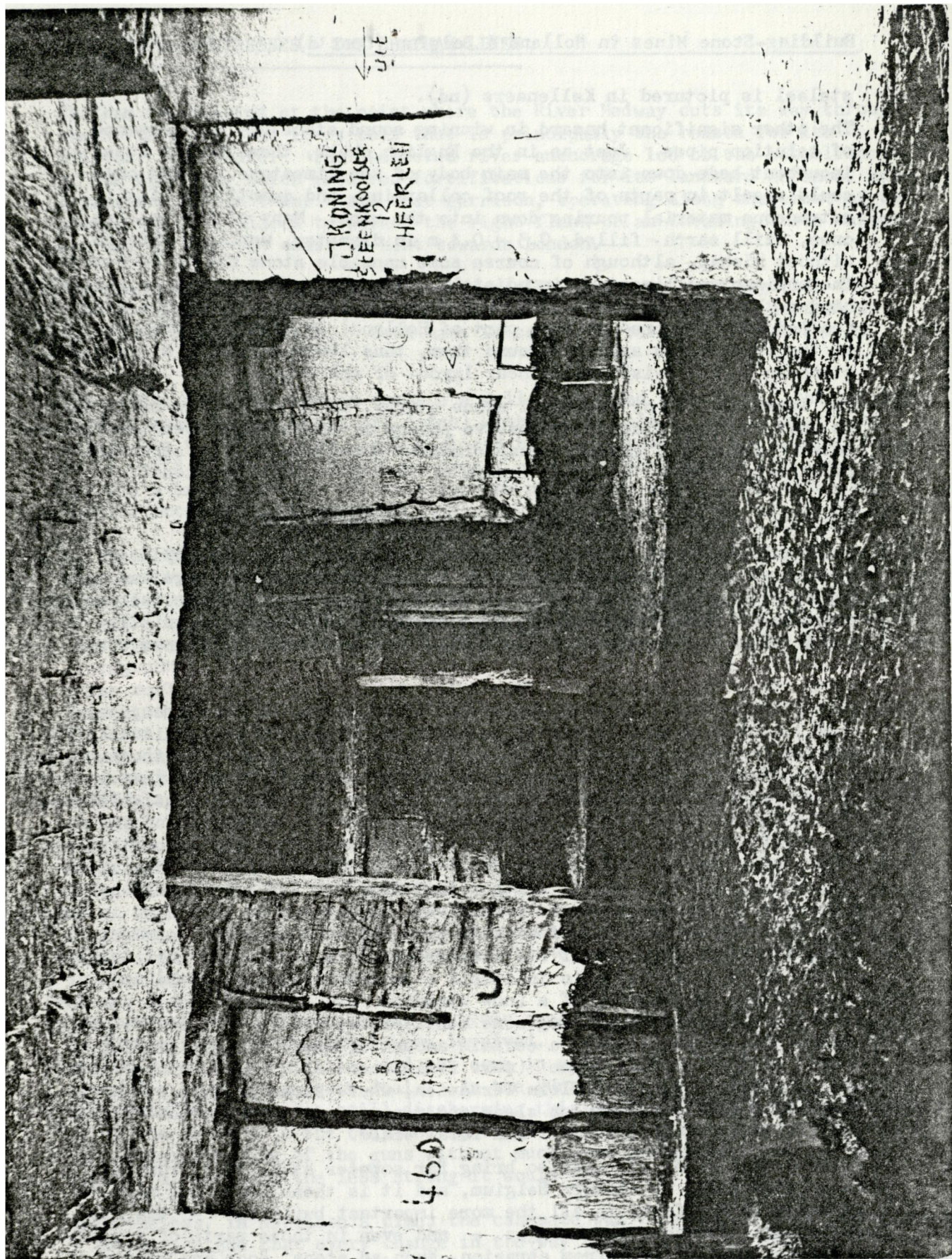
The only single-phase mine I saw, out of a total of about 15 visited, was that at Sibbe. For the rest, those who know the 'Cathedral' at the Box mines should best visualise the Dutch and Belgian systems as of something approaching comparable dimensions throughout!

A desire to win as much stone as economically and safely as possible often led to progressive widening of each generation of galleries, leading to corbelled or inverted-pyramidal pillars, although under more cautious direction side-walls were maintained truly perpendicular. Reckless management, or perhaps unsupervised individuals working in otherwise abandoned parts of the mines on their own behalf, practiced 'rofebouw' or 'pillar-robbing' - squared blocks being methodically cut from the corners and sides of the pillars left, as experience demanded, to support the roof. This dangerous practice, as with the crude hacking-away of pillar material for lump limestone already mentioned, seemed commoner in Belgium than in Holland.

Geological Factors

As the Kunrader and Maastrichtse Kalk strata are effectively horizontal, there have been hardly any problems in the mines, such as so often bedevilled English workings, of the dip carrying the stone below the water-table, or simply constituting an obstacle to the extraction of stone from the mines (one small hearthstone mine at Brockham, Surrey, had stone being hauled up drifts excavated in a bed dipping at over 20°!) Very little evidence of flooding is encountered in the stone mines around Maastricht. In St. Pietersberg and Louwberg hills (east and west of Jekerdal) the cutting of the Belgian Albertkanaal in 1930 led to the water table being lowered by up to 12m, thus considerably reducing the likelihood of flooding in the numerous mines around and under the national frontier.

Faulting was encountered, on a small scale, and it was not always easy for the quarrymen to determine the direction or amount of the throw. Where a good seam of stone was being followed and was then brought to an end by up-faulted or down-faulted inferior or flinty material, exploratory 'proef-tunnels' (proof-tunnels) barely more than a metre square were sent forward, inclined upwards or downwards as was judged best, in search of a continuation of the good stone. When unsuccessful, these were either widened to, or by-passed by, an appropriately inclined main drive to the new area of working. Unsuccessful proof-tunnels were abandoned after, perhaps, five or ten metres of profitless searching. Several such tunnels can be seen in the Sibbegroeve, and one in the St. Pietersberg Noordelijk



BEMELLEN : Inside an underground stone quarry at Bemelen. Here there has not been extensive multi-stage working, so the floor-to-roof height is not great. The sizes of blocks taken can be clearly seen from the tool markings on walls and roof - ca. 60 cm. square by two or three metres high.

Building-Stone Mines in Holland & Belgium (Cont'd)

stelsel is pictured in Kellenaers (nd).

The other significant hazard in winning sound stone was the presence of solution pipes. Just as in the English chalk, these funnel superincumbent beds down into the main body of the limestone. Large ones could result in parts of the roof collapsing, and quantities of extraneous material pouring down into the mine. Many of the smaller ones, still earth-filled, 0.3 - 0.4 m in diameter, were cut through without mishap, although of course some unusable stone had to be removed. The undissolved limestone immediately surrounding these pipes is generally harder than normal, and it was therefore relatively easy for the miners (called 'blokbekers' in this part of Holland) to recognise the proximity of the larger ones and work round them, thus leaving islands of rejected stone in an otherwise rectilinear layout of galleries.

The Gemeentegrot, or municipal stone quarry, at Valkenburg is remarkable in that, in some places, successive phases of working have been carried on leaving one set of galleries superimposed above another - separated by relatively thick (1 - 1.5 m) layers of inferior or flinty stone.

Transport and the Area within which the Stone was Used

Evidence, inside the mines, for horse-drawn carts has already been mentioned, and it seems likely that the same means of carriage was employed from mine entrance to destination. Because, despite their vast extent, all these mines apparently served no more than the strictly local needs of, in the main, vernacular architecture - Pevsner would probably insist on 'building' as a more appropriate word! Although, quite exceptionally, some of this stone is reliably reported from early work in the cathedral at Keulen (Köln, Cologne) (Jacques Diederer, pers. comm.), which it must almost certainly have reached very circuitously via the rivers Maas and Rijn (Rhine), and although I have seen it in the Theatre Royale in Liege (a direct link via the Maas (Meuse)) I have so far discovered little evidence for its use outwith the immediate neighbourhood of the mines. Even the village of Bijsden and the small town of Visé (immediately north and south of the international frontier respectively, on the east bank of the Maas (Meuse)) have little or none of this stone in evidence. All in all it appears that although the stone could have been readily freighted up and down river, it was not so freighted in any significant quantity. The fact that the first-phase drift entrances along the eastern flanks of St. Pietersberg were dug such a considerable height above river level is in itself a possible pointer to the same conclusion. The opening of a (now abandoned and infilled) canal parallel with the river, running along some considerable distance below the quarry mouths, may have attracted a certain amount of heavy freight traffic - a very steep 'inclined plane' (more reminiscent of a narrow stone-shoot) was pointed out to me at Klein Ternaeien, where stone is said to have been let down (presumably on sleds and restrained by ropes) but even this was evidently on a very small and local scale.

Instead, the river was used to bring far sounder stone down from the Palaeozoic rocks of eastern Belgium, and it is these older and harder stones that are found in all the more important buildings - the City walls, the churches, the bridges - and even in those parts of domestic buildings most at risk from abrasion, such as steps, door and window jambs and lintels, and quoins. St. Pietersberg stone was used in foundations, internal and party walls, farmyard and garden walls, and on external walls (reportedly) only if the better stone from Sibbe or Valkenburg could not be afforded.

To be continued

PAUL W. SOWAN

UNDERGROUND FORTRESSES - THE CHATHAM LINES

Chatham is situated at the point where the River Medway cuts its way through the North Downs, and it is this that is principally the reason for its military importance. The sheltered river anchorage led to the establishment of the dockyard, which required fortifications for its landward defence, and a garrison to man them. And that garrison, operating along the crest of the Downs, was well placed to attack the right flank of an invading force making its way up from the coast of Kent towards London.

For present purposes we may ignore the earlier defences, and say that the land fortifications divide into two periods: Napoleonic, which we deal with here, and late Victorian. Both have in common certain basic features of design.

The mediaeval castle was in essence a wall surrounded by a moat; the artillery fort, a moat (now mostly a dry ditch) without the wall. This latter - so vulnerable to cannon fire - was replaced by a comparatively low earthen rampart, which would harmlessly absorb the impact of enemy shot, and at the same time provide a breastwork and platform for the defenders' guns. The ditch kept out the attacker's infantry.

In the middle of the eighteenth century such a ditch and rampart system, called Chatham Lines, had been constructed all round the landward side of the Dockyard, at a distance of about 700 yards (640 m.) from it - sufficient to ensure that it would be out of range of contemporary guns. Around the end of the century this system was elaborated, and it is here that underground works come into our story.

Leaving aside siege mining, we can say that underground structures in fortification are of the following types: casemates for guns, shelter, or accommodation; magazines; and communicating tunnels. Because of the obvious dangers in the event of enemy infiltration, and because of the expense and difficulty in digging and ventilating tunnels large enough to permit the rapid passage of many troops (especially without the advantage of Maginot-style electric railways), communication tunnels are much more limited in extent than is generally supposed; one must not, for example, expect to find nearby forts joined to one another underground.

Casemates are simply vaulted chambers, which, when used for defence, have musket loopholes or a cannon embrasure at one end, giving on to the open air in the direction of the enemy.

The protective advantage in putting your guns in casemates seems obvious; but in fact various difficulties were involved. One was smoke: cordite, which produced relatively little, did not come in until late Victorian times; gunpowder produced a great deal. As the guns were fired, they would recoil back into the casemate, still discharging this smoke, which would choke and blind the gunners in the confined space. And of course, there were problems in the mere working of the guns without much room being available. (The roomier a casemate, the less strong it would be.)

Nevertheless, in Napoleon's time, the casemate was very much coming into fashion. I do not pretend that every change in the way things are done must have some rational explanation. But here there was at least a partial one, in that there was an increasing use of explosive shells ("bombs") delivered overhead by plunging fire. And not only did casemates offer protection; they also permitted the defenders to mount a more powerful fire at any one point, because their guns could be placed in several tiers, one above the other.

Chatham Lines (Cont'd)

In Chatham an already-existing system of tunnels gave an opportunity for the construction of casemated positions. The tunnels - whose original extent is unknown - were called Chatham Cave. It has been suggested that it had been a chalk mine. Be that as it may, the tunnels were extended and incorporated into the fortifications.

The south section of Chatham Lines consisted of a ditch, some three or four hundred yards (274 m. - 365 m.) long, which ran down from the high ground to the river. This was realigned in such a manner as to permit three tiers of cannon - two casemate tiers, and one open battery - at the head of the ditch to completely sweep it with fire. The casemates were connected to the Chatham Cave system behind. In the immediate vicinity of the guns are alcoves for storing shot. A shaft runs to what is no doubt a powder magazine, on another level. The guns of the open battery had their own magazine, with a further shaft nearby communicating with the underground complex.

The tunnels have internal defences consisting of loopholed walls at various points, enabling defenders with muskets to fire upon an enemy who had gained access.

Although the Dockyard was immediately defended by the Lines, there remained an area of high ground south of the bend in the river, which an enemy might occupy. To prevent this further defensive works were constructed, the most important of which were Forts Pitt and Clarence.

Fort Pitt had a casemated accommodation block, now destroyed. Near it is an underground magazine, which was reinforced with concrete and used as an air-raid shelter in the second World War.

There was also a curious privy, under the ground outside the ditch, and reached by a tunnel passing underneath it.

Fort Clarence again had a length of ditch running down to the river. This was covered by casemated guns within the tower of the fort, and also by guns within the West Casemate, which is joined to the tower by a 100 yard (91.44 m.) tunnel. The tower (itself quite a curiosity in this period) is indeed surrounded by a whole system of tunnels, which include a magazine, and a tunnel passing underneath the ditch to an exit on the other side - of course, with the usual internal defence loopholes. The East Casemates, covering a bend in the ditch on the other side of the tower, form a separate underground complex.

D. BARNES
Secretary of the Fortress
Study Group.

THE FOGOU AT CARN EUNY, CORNWALL

At the first meeting of this society, in September 1974, I was privileged to describe briefly the only sizeable group of prehistoric monuments which fall within the scope of Subterranea Britannica, namely the souterrains of Scotland, Ireland and Cornwall. Dating of souterrains, however, is notoriously difficult, and a number certainly continued to be built well into our era, especially in Ireland and parts of Scotland. But the Cornish examples, known locally as fogous, fall well and truly into the pre-Roman Iron Age. Admittedly only nine survive, out of a known total of twenty-one all confined to the extreme south-west of the county, and of these only two have been excavated this century by modern methods. A summary of the current situation can be found elsewhere (Christie 1979).

The Fogou at Carn Euny (Cont'd)

Last year Miss Sylvia Harris presented to the January Day Conference the intriguing possibility that one of these Cornish fogous may have been the site of the Lovers' Cave described in the medieval Tristan romances (Bulletin 10, 11-13). Miss Harris's discussion was drawn from literary evidence. The present piece on the fogou in question, that at Carn Euny, is based on the archaeological findings made in recent years.

The fogou at Carn Euny (formerly Chapel Euny) does not appear to have been known until the 19th Century when it was discovered by miners prospecting for tin and a brief note published in Penzance in the 1840's. Excavations by W. Copeland Borlase followed in the latter part of the century, concentrating on the fogou only. Some sporadic clearance of two houses was carried out in the 1920's by local antiquaries. Fogou and settlement were taken into guardianship in 1953 by the Ancient Monuments inspectorate of the Ministry of Works (now Department of the Environment) and the site continues to be maintained by the Department. Excavations in advance of conservation work were carried out between 1964 and 1972 and both fogou and settlement were thoroughly examined.

The fogou roughly bisects the village and is aligned NE/SW. The circular pit and trench containing the stone structures were cut into the hillside across the slope to a depth of 6 - 8 feet (1.82 - 2.43 m.) on the uphill side. The fogou consists of three main structural elements, as a glance at the plan in Bulletin No. 1 will show, and these can be correlated with the first three phases of the Iron Age settlement:

1. the round chamber and its integral entrance passage, dated to the 5th and 4th Centuries BC -
2. the long curved passage, probably closed at both ends, and the integral side passage ('creep'), dated to the 3rd - 1st Centuries BC -
3. the sloping east entrance with uprights at the end, leading into Courtyard House I of the settlement, dated to the 1st Century BC/1st Century AD.

Round Chamber (phase 1)

This circular stone chamber, built within a pit, has a base diameter of 15 feet (4.57 m.). It is corbelled inward so that the top of the surviving walls, which stand 8 feet (2.43 m.) high, is only 10 - 11 feet (3.04 - 3.35 m.) in diameter, and the top corbel is level with the original ground surface on the uphill side. Examination of the walls showed there to be no visible break in the stonework except for a recess on the north and the doorway opposite it which leads into the roofed entrance passage. Excavation outside, however, revealed a construction trench on the west leading into the pit but completely sealed by the building of the walls. Paving slabs covered the floor and a central pit may have held a post, possibly to support a timber and thatch roof to the chamber. Paving also covered a gully which flowed through the entrance passage and joined the main gully draining the long passage. There is evidence that this entrance passage to the round chamber may have been longer originally, but was cut by the long curving passage in phase 2.

Long Passage and 'creep' (phase 2)

This is 66 feet (20.11 m.) long and averages 6 feet 6 in. (1.98 m.) wide. The dry stone walls are corbelled inwards and the passage is roofed with massive granite capstones, some of which were replaced in their original position during the excavations. The roof would have been level with the original ground surface on the uphill side, while the downhill side was revetted by vertically placed stones which appear to have retained a slight mound over the structure.

The Fogou at Carn Euny (Cont'd)

The small creep structure, with 4 uprights supporting a massive capstone, opens off the north side near the SW end of the long passage. A deep cut in the subsoil beyond the SW end appears to have been a sump in the later Iron Age. But before this was dug the fogou may have been closed at this end, while the other, north-eastern end is thought to have ended up against the country in the same way. If this was so, the only way into the fogou would have been down the narrow 'creep', and it would have been a very secret place. This, together with other evidence suggests that it may have been associated with some sort of cult in the Early Iron Age religions of the south-west.

In phase 3, however, a change came about and the east end of the fogou was opened up into a sloping entrance with 2 uprights at the top. This leads directly into a large enclosure (Courtyard House I) here and connects with the main paved entrance to both house and fogou on the north.

Sometime prior to the 19th Century the long passage and 'creep', but not the round chamber or its entrance passage, had been filled with earth right up to the roof. This was cleared out by Borlase, whose descriptions suggest only that the blocking was post-Roman. It would be interesting to know when and why this earth was put in, and whether it was already there in the Middle Ages. No finds later than the 4th Century AD have been recovered either from the fogou or the settlement, until the 18th Century. Pottery was found associated with a small cottage built c. 1750 on the west of the site, just beyond the SW end of the fogou.

Although there is no written mention of the site before the 19th Century, it seems unlikely that it was not known by the local inhabitants. In addition to the 18th Century cottage almost on top of it, other cottages exist in the neighbourhood, and the holy well of St. Uny, with its now destroyed chapel, is only 300 yards (274.32 m.) away to the west and was well known at least during the month of May. For, as a 19th Century account tells us:

"On the first three Wednesdays in May, children suffering from mesenteric diseases are dipped three times in this well against the sun, and dragged three times around the well on the grass in the same direction".

But whatever activities went on in the overgrown village and well-concealed structure below ground, between the abandonment of the settlement in the 4th Century AD and the building of the cottage in the 18th Century AD, no trace of them has survived in the archaeological record.

PATRICIA M. CHRISTIE

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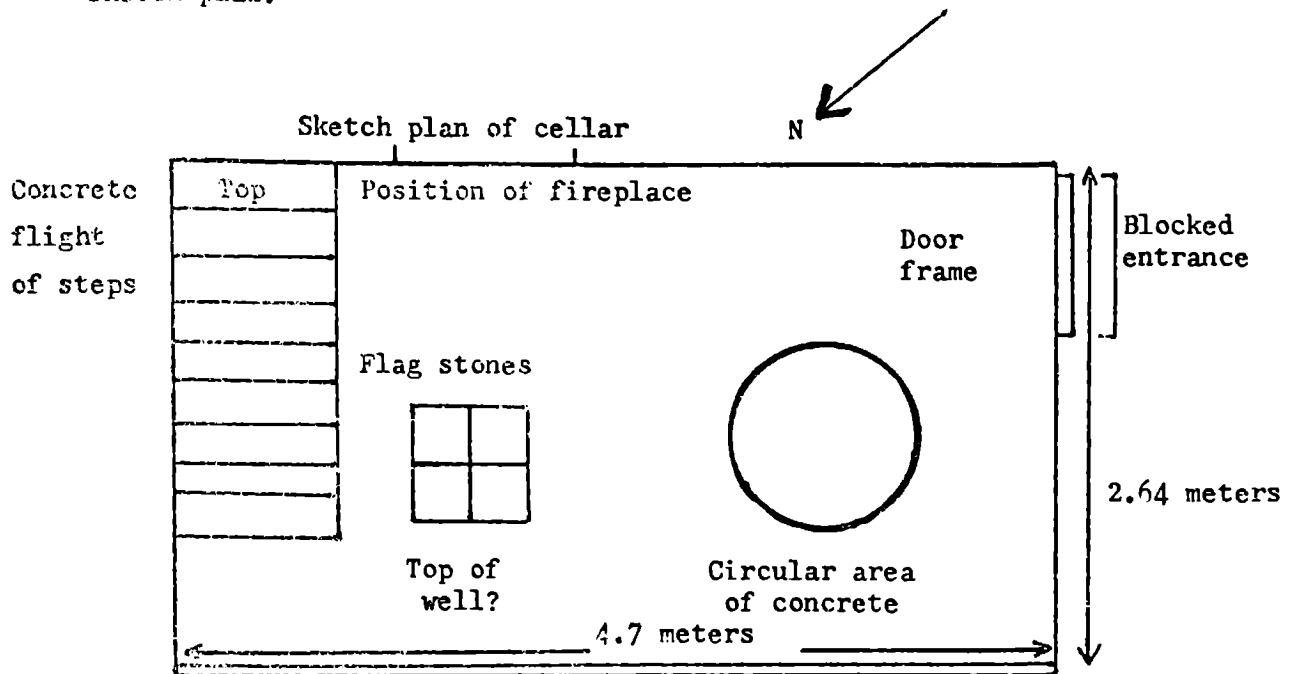
Editor: The line print on the cover of Subterranea Britannica is the stylised plan of the Carn Euny fogou.

BALDOCK CELLAR AT NO. 4 CHURCH STREET

The cellar at No. 4 Church Street, Baldock, one of a number of buildings (built late 18th Century) being stripped and rebuilt in the town, was surveyed by five members of the Cambs. and Herts. Branch of Subterranea Britannica on the 28th October, 1979, seeking an underground tunnel.

After entering No. 4 the access to the cellar is by a flight of concrete steps on the far side of the first floor room. The cellar was found to be an excavation into chalk and brick-lined, this is a common practice in this area. The visible side of the bricks being 20 x 6 cm., these were used on three walls facing S.E., N.E., and S.W., the fourth wall facing N.W. was found to be breeze blocks. This comparatively recent wall had been constructed to divide the cellar into two sections, the other part being under the house known as No. 6 Church Street, this cellar was not entered.

The floor was largely covered with bricks, but a square area near the bottom of the steps was found to be covered by four flag stones, possibly the top of a well and a second area covered by a circular area of concrete, see sketch plan.



No. 4 Church Street, Baldock, Hertfordshire

An interesting feature was found in the left side of the S.W. wall, this feature, a door frame 1.47 m. high and 84 cm. in width. 68 cm. beyond the door frame a bricked arch was to be seen. At first, on the day of the survey, it was thought that the arch was the entrance to an underground passage but since then Mr. Reeves, the builder, has removed some of the general rubble and found no evidence of a passage.

The other major feature to be seen was the remains of a fireplace towards the left hand end of the S.E. wall, the flue of which adjoins the chimney of the first floor room. (see photo). Nothing much remains of the fireplace to show its purpose, but in the general debris a large quantity of whelk shells were found together with a 'Reckon', this is an iron bracket approx. 50 cm. in length and may have been used for supporting a cooking pot, reference the whelk shells.

JOHN SCOTT



The fireplace

Photo - John Scott

FOOTNOTES:

1. A subsequent telephone call (14.4.80) was made to Mr. Reeves. The archway has now been blocked-in with breeze blocks and the builders did not remove the rubble which comprised of large heavy lumps of concrete. It seems Mr. Reeves himself had examined the arch at the back towards the top, however, was not able to test the wall lower down. The top area, of course, may have been keyed into the solid bedrock behind therefore this probing cannot absolutely prove that a tunnel did not exist. He pointed out that if the tunnel had run from this area it would have been broken into anyway as the sewerage pipe runs down the road outside. (We would like to thank Mr. Reeves for his kind consideration in allowing us to visit the premises.) The floor of the cellar has been screeded over.
2. It would seem that the fireplace had been used to boil whelks and Mrs. Margaret Walker found the following information from Food in England by Dorothy Hartley. Macdonald & Co. Ltd. London. 1969 (5th impression) p.277.

Baldock Cellar (Cont'd)

"Welkes Boyled"

"Take welkes and cast hem in cold water and lat boyle but a littul, an caste hem into a vessell and pyke hem oute of the shell and picke away the horn of hem, and wasshe hem, and rubbe hem well in cold water and salt two or three waters and serve hem colde and caste upon hem leves of perceley wet in vinegar."

The recipe is unchanged, wash the whelks and drop into boiling water but immediately draw aside, as they must not actually boil or they will harden. Unshell, removing the little hard cover piece, rinse clear of any particles of sand and serve with parsley sauce, or cold, with mayonnaise sauce and garnished with parsley.

REVIEW

SUBTERRANEAN BRITAIN Ed. Harriet Crawford ISBN 0 212 97024 0 John Baker (Publishers) Ltd. Price £7.95. Published 17th January, 1980.

Dr. Crawford has brought together six specialists in their field to produce a very useful work on underground archaeology in Britain. Man has extracted materials from beneath the surface from very early times and this volume traces man's underground activities from prehistoric to the industrial revolution.

G. de G. Sieveking gives an excellent account of Grimes Graves and European prehistoric flint mining with details of how the miners worked and developed the mines. The first mines for metallic ores are dealt with by Dr. Barnes who also shows how, in geological terms, the metalliferous deposits were laid down. Prof. Jones takes up the story in Roman times and traces the development from simple adits and open cast pits to deep gallery mines. A different type of underground work is discussed by R. Warner in a chapter on Irish Souterrains, giving details of distribution, construction and possible uses of these structures. K. Hudson writes on the early industrial era when the range is extended to include coal, iron, and large scale stone mining. The final chapter by Barbara Jones is on mediaeval and 18th Century curiosities and utilities such as Ice Houses, Grottoes, Follies, etc.

My only regret with this book is that I feel there should be an appendix listing the leading societies working in this field, i.e. Subterranea Britannica, Chelsea Speleological Society, and the various mine research groups.

It is, however, a volume that should be on the bookshelf of anyone interested in underground archaeology.

R. F. LEGEAR.

NOTES

Anyone wishing to obtain a free copy of a brochure listing 320 Caving Books should apply to: Mrs. Anne Oldham, Rhychydwr, Crymmych, Dyfed SA41 3RB.

The next Conference Day of Subterranea Britannica, to include the A.G.M., will be held on Saturday, 18th October 1980 at "Straithaird", Lucy Cavendish College, Cambridge.

Next year's Study Weekend will be held in the Reigate, Surrey area, details will be circulated.

